CLAIMS

1. A digital control system for voltage converters, comprising:

an oscillator that issues a pulse;

a duty cycle generator, wherein the pulse is used to load a numerical value stored in a memory of the system into the duty cycle generator;

a digital counter that stores and alters a duty cycle;

a first comparator that determines how the duty cycle must be modified; and

an algorithm generator producing an algorithm that determines the rate of change of the duty cycle.

2. The system of claim 1 wherein if the comparator detects that an output voltage is higher than a reference voltage, the comparator retards the issuance of the pulse in a cyclical fashion, thereby creating a burst of pulses with a desired duty cycle.

3. The system of claim 2 further comprising a second comparator having a reference different than the first comparator.

4. A method for producing a desired output voltage comprising:

storing in memory, an indication of a pulse duty cycle needed for a varying load;

monitoring the load;

altering the stored duty cycle at a first frequency to produce the desired output voltage based upon the indication; and

if a change in the load is detected, changing the frequency of alteration of the duty cycle.

5. The method of claim 4 wherein the indication comprises a digital counter, and wherein changing the frequency of alteration of the duty cycle comprises changing the frequency of updating the digital counter.

6. The method of claim 4 wherein monitoring the load comprises usage of two or more comparators.

7. The method of claim 4, wherein if the load increases, the frequency of alteration is increased, thereby minimizing a dip in the output voltage.

8. The method of claim 6, wherein the two or more comparators each have a different reference.

9. A voltage converter that produces an output voltage, comprising:

a digital controller that controls the output voltage of analog circuitry;

a numerical value stored in a memory of the converter;

a duty cycle generator that utilizes the numerical value to alter the duty cycle of the analog circuitry;

a first comparator that compares the output voltage to a reference voltage at a first rate; and

a second comparator that compares the output voltage to the reference voltage at a second rate,

wherein the numerical value is updated based upon a comparison at the first or second rate.

10. The voltage converter of claim 9 further comprising an algorithm generator that selects the speed that the numerical value is updated.

11. The voltage converter of claim 9 wherein the digital controller selects either the first or second rate.

12. The voltage converter of claim 9 wherein when either comparator detects that the output voltage is higher than the reference voltage it decreases the duty cycle.

13. The voltage converter of claim 9 wherein when either comparator detects that the output voltage is lower than the reference voltage it increases the duty cycle.

14. The voltage converter of claim 9 wherein the numerical value is stored in an up-down counter in the memory, and wherein if either comparator detects that the output is lower than the reference voltage it switches the up-down counter in up mode, and if the reference voltage is lower, it switches the up-down counter in down mode.

15. A method for bucking or boosting a voltage, comprising:

providing groups of pulses, each group comprising one or more pulses;

detecting the rate of change of an output voltage over time;

modifying the frequency of generation of the groups of pulses in response to said rate of change;

detecting the magnitude of the output voltage; and

changing a pulse width of the output voltage in response to the detected magnitude.

16. A digital controller of a voltage regulator, comprising:

an up/down counter that stores a numerical value used to alter a duty cycle of the controller driving a transistor/switch;

a duty cycle generator that utilizes the numerical value to alter the duty cycle; and

an algorithm generator that produces an algorithm that alters the rate of change of the duty cycle.